

SUPPLEMENTAL NOTES ON BOLIVIAN XYRIS (XYRIDACEAE)

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ABSTRACT

Examination of Bolivian material of Xyridaceae sent from the Missouri Botanical Garden for identification has shown two novelties in *Xyris* (***X. crassifunda***, ***X. submetallica***). These are hereby described and illustrated and their relationships discussed.

RESUMEN

El examen de material boliviano de Xyridaceae enviado por el Missouri Botanical Garden para identificación ha mostrado dos novedades en *Xyris* (***X. crassifunda***, ***X. submetallica***). Se describen e ilustran aquí y se discuten sus relaciones.

Of the Bolivian Xyridaceae sent to me for determination from the Missouri Botanical Garden, two are distinct and are not found in existing treatments (Kral 1988, 1994; Maguire & Smith 1964; Smith & Downs 1968). These are presented below.

1. *Xyris crassifunda* Kral, sp. nov. (Fig. 1). TYPE: BOLIVIA. SANTA CRUZ. Velasco Prov.: Parque National Noel Kempff M. Los Fierros, a 500 m del ultimo arroyo, sobre el Camino a la meseta, bosque de galleria, suelos arcillosos, con arena y humus, 650 m, 14° 45'2"S, 60° 45'29.8"W, 26 Ago 1995, R. Guillen, F. Mayle, F. Soliz & J. Surubi 4175 (HOLOTYPE: USZ; ISOTYPES: MO, VDB).

Planta perennis, caespitosa, juncea, (5–)6–7(–7.6) dm alta, basibus caudiciformis, lignosis, dilatatis, persistentes veteras foliorum obtectis. Caules incrassati, sublignosi. Folia principalia rigida, ascendentes vel erecta, flexuosa, 35–45 cm longa, vaginis scaporum longiora; vaginae integrae aut a basin ciliatae, laminis 4–5-plo breviora, prope basem castaneae vel rufobrunneolae, ecarinatae, sursum luteobrunneolae, transverse rugulosae aut rugosae, in laminas abrupte, tum gradatim decrescentes, ad apicem ligulatae, ligulae recta, 3–3.5 mm longa. Vaginae scaporum prope basin lamprobrunneolae, apicum versus apertae, brevilaminae. Scapi recti, flexuosi et torti, a basin lamprobrunneolae, sursum flavovirenti, 1–1.2 mm crassae, pauci et grosse costatae, transverse subtiliter vel manifesto undulato-rugulosae. Spicae obovoideae, 1–1.2 cm, pluriflorae; bracteis firmis, spiraliter imbricates, convexis, ecarinatis, atrorufobrunneolis, areis dorsalibus anguste ellipticis, pallide brunneolis, ca. 2 mm longis; bractee steriles 3–4, ovatae vel obovatae aut oblongae, 5–6 mm longae; bractee fertiles late obovatae vel oblongae, 6–7 mm longae, integris, turn erosis. Sepala lateralia libera, inaequilateralia, 7–7.5 mm longa, acuta; ala carinali curvata, a basin a medio ciliata, a medio ad apicem villosi-ciliata vel, ad apicem, fimbriata. Laminae petalorum ellipticae vel obovatae, ca. 7 mm longae, luteolae. Staminodia bibrachiata, brachiis 2 mm longis. Capsula anguste ellipsoidea, 5 mm longa; placenta basalis. Semina numerosa, ellipsoidea, longitudine grosse anastomososo-costata, rufobrunneola, ca. 1 mm longa.

Plants slender, rushlike, caespitose, hard-based, perennial, (5–)6–7(–7.6) dm high. Roots fibrous. Shoots short, stout, hard, close-set, arising from a ligneous, caudex-like base, stem bases often hidden by persistent, dark fibrils from old leaf bases. Principal leaves erect or ascending, flexuous and twisted, 35–45 cm long, longer than the scape sheaths; sheaths entire or basally ciliate, $\frac{1}{5}$ – $\frac{1}{4}$ of blade length, the convex, several-carinate base of outer (lower) principal leaves, more dilated, often ciliate, more abruptly narrowed distally than those of the upper, all at very base castaneous or dark red-brown, smooth, upsheath becoming paler, transversely rugose or rugulose medially, the smooth, chartaceous borders gradually narrowed, apically converging to an acute ligule 3–3.5 mm long; blades narrowly linear, twisted and flexuous, 1–1.5 mm thick at level of ligule, gradually narrowed distally to a subulate-conic tip, coarsely and unevenly few-costate, costae making rounded angles, these and the uneven shallow sulcae yellow-green or tan, transversely finely papillose-rugulose. Scape sheaths firm, rounded-costate, yellow-green, papillose, conduplicate, smooth and red-brown proximally, open apically, the chartaceous edges converging as ligule, the apex projecting just beyond as a stubby, conic, apiculate blade. Scapes erect, twisted, proximally 2–2.5 mm thick and lustrous red-brown, distally narrowing to ca. 1.5 mm thick, coarsely low-costate, increasingly transversely rugulose-papillate, dull yellow-green. Mature spikes several-flowered, obovoid, 1–1.2 cm; bracts firm, spirally

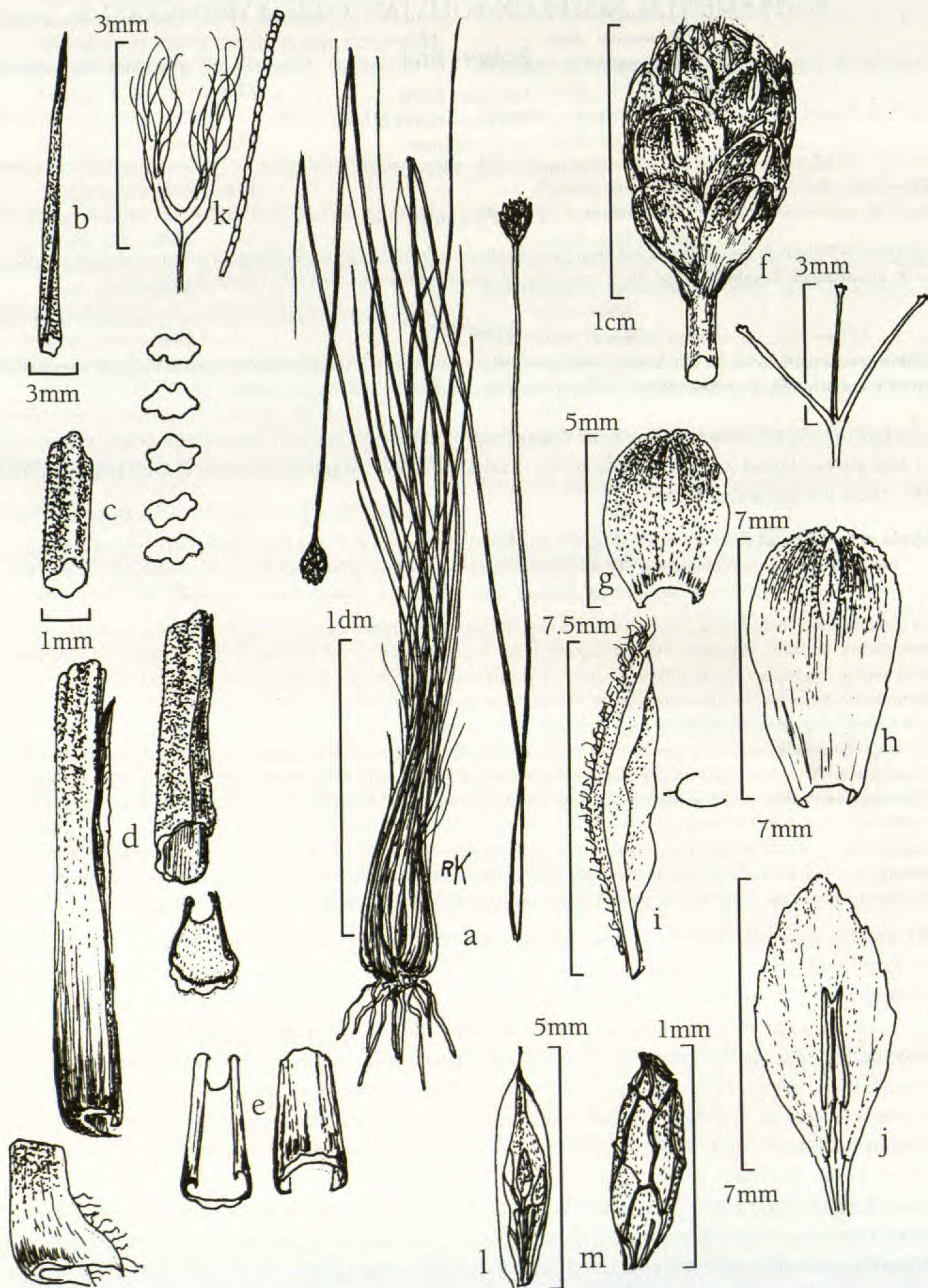


FIG. 1. *Xyris crassifunda* (from the VDB isotype). A. Habit sketch. B. Leaf apex. C. Sector of leaf midblade (right). D. Leaf base showing ligule (left, above); sector of leaf sheath and blade (right above) with idealized sector of leaf base. E. Adaxial (left) and abaxial idealized views of leaf base. F. Spike. G. Lower sterile bract. H. Lower fertile bract. I. Lateral sepal. J. Petal blade & stamen. K. Staminode (left); idealized enlargement of beard hair (right). L. Capsule, one valve removed. M. Seed.

imbricate, backs convex, ecarinate, dark red-brown with distinct, paler, narrowly elliptic dorsal area ca. 2 mm long; sterile bracts few, ovate to broadly obovate, transitional to fertile, the lower two ca. 5 mm, ovate, these obovate to oblong, 5.5–7.5 mm, the distal narrowest, all apically rounded, borders narrow, scarious, entire, becoming shallowly erose. Lateral sepals free, inequilateral, narrowly elliptic to oblanceolate, the firm keel proximally ciliolate or entire, medially increasingly crisped ciliate, apically crisped-fimbriate. Petal blades elliptic-obovate, ca. 7 mm long, irregularly low-toothed apically, broadly acute, yellow. Anthers lance-linear, ca. 3 mm, apically shallowly emarginate, base sagittate, on filaments ca. 2 mm; staminodia bibrachiate, 3 mm, including dense brushes of moniliform beard hairs. Capsule narrowly oblong-ellipsoid, ca. 5 mm, placentation basal. Seeds irregularly ellipsoid, ca. 1 mm, dull red-brown with darker coarse, anastomosing, irregular ribs.

Distribution.—Known only from a meseta slope, on a sandy clay substrate by gallery forest, eastern Bolivia. Represented solely by the type collection.

Material of this xyrid shows traits both of *Xyris rigida* Kunth, Enum. Pl. 4:15, 1843, and *X. vacillans* Malme, Bih. Kongl. Svenska Vetensk.-Akad. Handl. 24, Afd. 3, No. 3: 10, plate 1, fig. 7, 1898, both of the planaltan Campos of southern Brazil, thus part of that complex of tall, slender, rush-like perennials whose leaves have distinct auricles and whose spike bracts produce distinct dorsal areas. Unfortunately it shares some of the distinguishing characters of both, but the characters are combined differently. Since this is the only example gotten thus far, it may be that intermediates will turn up as eastern Bolivia is further explored, but until such happens it seems best to introduce this as a species.

Etymology.—The name “crassifunda” refers to the thickened caudex-like base.

2. *Xyris submetallica* Kral, sp. nov. (Fig. 2). TYPE: BOLIVIA. SANTA CRUZ. Velasco Prov.: Parque Noel Kempff M. Pampa Toledo, 5–10 km al NE del campamento Los Fierros, sobre el camino a Tarbo, pampa humeda con isles arboreas termiteras, ca. 200 m, 14° 35'S, 60° 53'0"W, 1 Jul 1993, M. Saldias, Arroyo, Mostacedo, Guillen, Gutierrez, Zapata y Pena s.n. (HOLOTYPE: USZ; ISOTYPES: K, MO, VDB).

Planta perennis, caespitosa, 5–7 dm alta, basibus firmis, per bases persistentes veteras foliorum oblectis. Caules incrassati compactis. Folia principalia rigida, disticha, anguste flabellate expansa, 4–5 dm longa, vaginis scaporum longiora; vaginae integrae, laminis 2–3-plo breviora, a basin atrocastaneae, nitidae, dilatae, tum in laminas gradatim decrescentes, eligulatae; laminae compressae, tortae, 2–4(–4.5) mm latae, minute punctatae; apices anguste incurvato-acuti; margines leviter incrassates, scabridis. Vaginae scaporum prope basem nitidae, rufobrunneolae, teretes, multicostatae, apicem versus apertae, laminis brevibus. Scapi apicem in sectio transversalis ovati, ca. 1–1.2 mm lati, leviter compressi, multistriati, punctati, unicostati, costis scabridis aut papillosis. Spicae multiflorae, obovoideae, ca. 1.2 cm longae, obtusae, attenuatae. Bractae erectae, laxe spiraliter imbricatae, vadosae convexae, lamprobrunneolae, sine area dorsalis, integrae tum minute laceratae; bractae steriles plures, in fertiles gradatim transientes, infimis ovatis, usque ad 6 mm; bractae fertiles 6–7 mm anguste ovatae in oblongae gradatim transientes. Sepala lateralibus libera, leviter inequilateralibus, oblongo-lanceolata, ca. 7 mm longa, ale carinali a basin ad apicem ciliatis vel ciliolatis. Laminae petalorum late oblongae, flavae, ca. 5 mm longae. Antherae lanceolate-oblongae, sagittatae et emarginatae, 2–2.5 mm longae. Capsula oblongo-lanceoloidea, ca. 5 mm longa; placenta basalis. Semina asymmetricae ellipsoidea, 0.7–0.8 mm longa, atroferrugineofusca, multicostata.

Stout-based, caespitose perennial 5–7(–8 est.) dm, the stems contracted, hard. Leaves erect or in narrow fans, the outermost mostly scale-like, bladeless. Principal leaves 4–5 cm, sheaths ca. ½–⅓ as long as blades, entire, abruptly dilated, convex, multicostate at base, castaneous, distally keeled, gradually narrowed, eligulate, to blade; blades linear, flattened, 2–3 mm wide, shallowly several-nerved, surface smooth with lines of elliptic punctae, margins narrowly incrassate, densely scaberulous, narrowed to a narrowly acute, somewhat thickened, apex. Scape sheaths tubular, lustrous red-brown, twisted, short-bladed, shorter than leaves. Scapes erect to ascending, twisted, proximally ca. 1.5 mm, distally ca. 1 mm thick, rounded to oval in cross-section with low, irregular ribs, smooth save for lines of narrowly elliptic punctae and one strong, scaberulous costa. Spikes obovoid, ca. 1.2 cm long, of many, spirally imbricate, convex, brownish or reddish-brown, lustrous bracts without evident dorsal areas, base attenuate, of many sterile bracts, the lower ones smallest, broadly ovate, ca. 2 mm, grading upward to larger, progressively longer, more oblong fertile ones; fertile bracts prevalently oblong-ovate to oblong, 5.5–7 mm, those of midspike and above narrowest in outline, apically rounded-emarginate, erose or entire, and with a prominent, though narrow, raised midvein cresting a shallow apical angle. Lateral sepals free, inequilateral, oblong-lanceolate to oblong-oblanceolate,

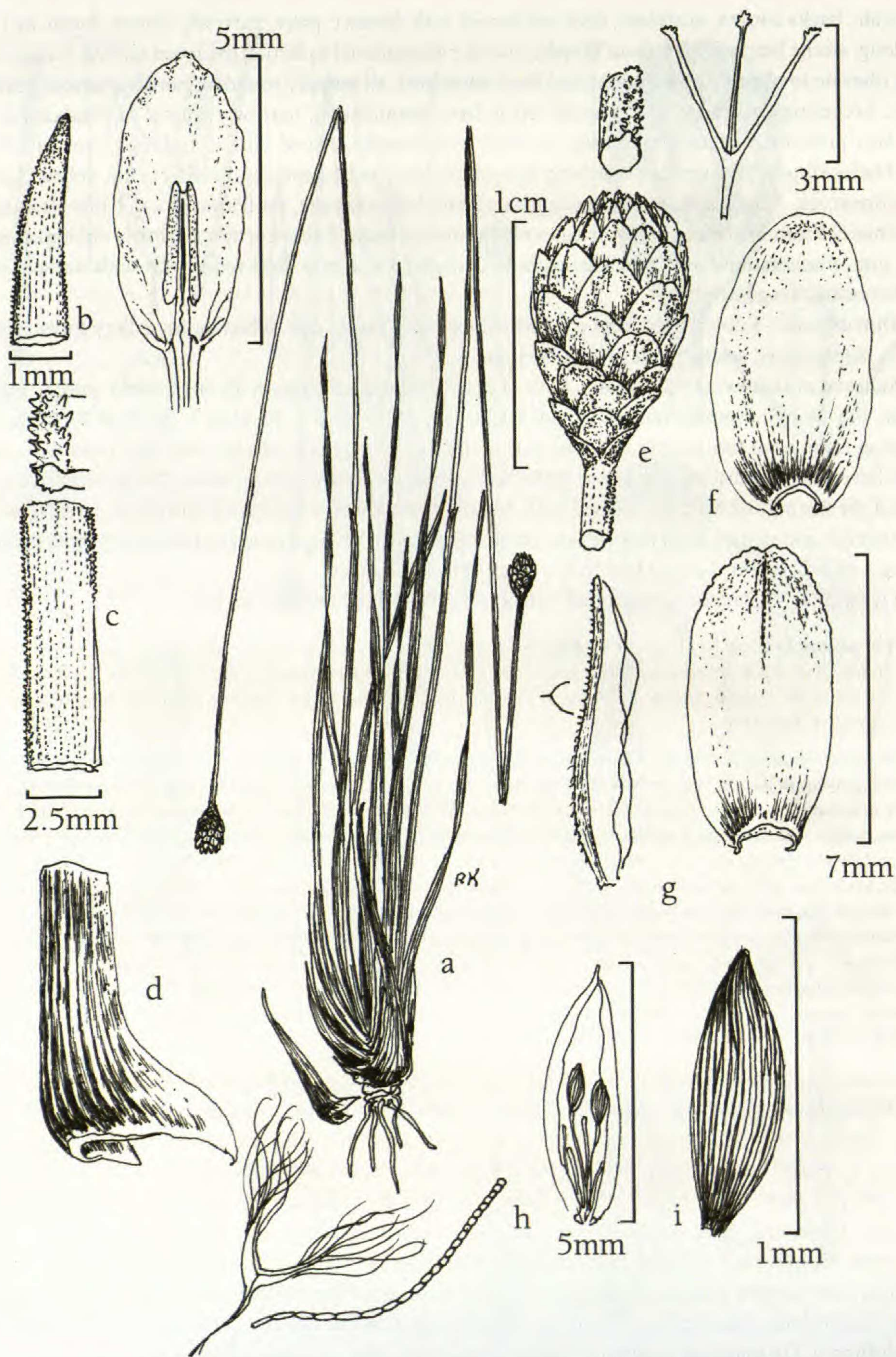


FIG. 2. *Xyris submetallica* (from the VDB isotype). A. Habit sketch. B. Leaf apex. C. Sector of leaf midblade and junction with sheath (below); small sector of blade margin. D. Leaf base. E. Spike & scape sector. F. Lower fertile bract (above); upper fertile bract (below). G. Lateral sepal. H. Staminode and idealized sector of beard hair (left); capsule, showing placentation. I. Seed. J. Petal blade & stamen. K. Stylar apex.

ca. 7 mm long, the narrow, firm, shallowly sigmoid-curved keel mostly antrorsely or retrorsely pilosulous-ciliate medially, antrorsely ciliate distally. Petal blades (est.) oblong-elliptic, ca. 5 mm, bluntly acute, yellow. Anthers lance-oblong, 2–2.5 mm, emarginate and sagittate, on stout filaments ca. 2 mm. Capsules lanceoloid, ca. 5 mm, light brown; placentation basal. Seeds asymmetrically ellipsoid, 0.8–0.9 mm, dark red-brown, not farinose, longitudinally finely multiribbed.

Distribution.—Known thus far only from the type locality, one of humid grasslands around forested islands and amongst termite mounds.

In character of habit, leaf, and scape this example fits *Xyris metallica* Klotsch ex Seub. However, the spikes are longer, attenuate (thus narrower-based), and with several more sterile bracts of distinctly different character. Many of the mid and upper bracts of a spike have distinct, if shallow, keels apically, with strong midnerves (apically often darker-pigmented) marking the crests of that shallow angle. The lateral sepals and seeds are longer.

Etymology.—The name “submetallica” is applied here against the possibility that connecting morphologies will prove a relationship.

ACKNOWLEDGMENTS

The kindness of curators as well as that shown by the original collectors is very gratefully acknowledged. Richard Carter (VSC) kindly assisted with technical aspects of preparing the manuscript. I kindly thank two anonymous reviewers for their helpful comments.

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